GENERIC TYPES WITH SPECIAL REFERENCE TO THE GRASSES OF THE UNITED STATES

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Efforts have been made in recent years to stabilize nomenclature by proposing rules to govern nomenclatorial changes. An important advance in the progress of nomenclatorial reform was made when the idea of types was introduced, the idea that a genus should be based upon a type species, and that a species should be based upon a type specimen. In the future an element of stability will be introduced if authors of generic and specific names will definitely designate the types of the groups they publish, something rarely done except within recent years. If the idea of types is introduced into our nomenclatorial system, and if the application of the idea is made retroactive, it becomes necessary to select types for groups for which no type was designated by the author.

The present paper is concerned with generic types. Rules have been proposed by committees and congresses for the selection of type species of genera. The intention has been so to frame these rules that they may be applied automatically, that all investigators shall arrive at the same result in applying them, and that individual judgment shall be eliminated. However, it has been impossible to foresee all contingencies, and experience has shown that no such set of rules can be automatically applied with satisfactory results. I doubt if rules can be so framed as to eliminate personal judgment, and I furthermore deprecate such an attempt. I believe that an effort should be made to agree upon principles and that judgment should be used by the individual in making application of the principles to individual cases. I furthermore believe that the road to uniformity lies through agreement rather than through the arbitrary application of rules. From whatever standpoint the question of generic types is viewed, it is evident that proposed action to obtain uniformity should be based upon a knowledge of the facts concerning a fairly large number of cases.

As a basis for a solution of the question the generic names of the grasses of the United States have been investigated, the facts bearing

upon the selection of types have been separated and arranged, and the type species selected according to certain general principles that will be set forth in the present paper. Types have been selected for proposed genera even though those genera may not be accepted as valid, because a non-valid name is referred as a synonym according to the identity of its type species.

Certain definitions and principles are the basis of the work here presented.

The type species of a genus determines the application of the generic name.

In any combination or division of groups the genus, however limited, must include the type species.

The type species is the species or one of the species which the author had chiefly in mind when the genus was established. We may often be justified in assuming that a certain species is the basis for a generic idea because of the fact that the author has figured this one or by the fact that he actually examined, or was more familiar with, a particular species. Sometimes a careful reading of the generic description makes it evident that the author based this description upon a particular species even though more than one species was included in the genus.

A change of name or a substitution of one name for another does not change the type.

The type is determined upon the basis of facts given with the original publication of the generic name. These facts may sometimes be interpreted by previous or subsequent historical data.

In a large number of cases it is easy to determine the type species directly, with results acceptable to all. There are, however, a considerable number of cases in which a more or less arbitrary selection must be made and in which the judgments of competent persons will differ as to the species selected. In the present paper space permits only a summary of results.

The generic names investigated number 255. These may be classified as follows:

1. The type species has been designated. Total 8.

2. Type not designated.

a. Monotypic genera, those in which only one species was mentioned at the time of the original publication. Total 150. In these monotypic genera the single species is indicated in a variety of ways.

(1) The species may be described, either as new, or as a transfer from another genus.
(2) The species may be mentioned without description under a described genus, as is frequently the case when a new genus is based upon an old species.
(3) A new generic name may be applied to a species previously described.
(4) The new genus may be connected with a previously published species by an indirect citation. Most of Adanson's genera are published in this way. Under the name Valota appears the citation of a plate in Sloane's History of Jamaica. Linnaeus cites the same plate under *Andropogon insularis*. Hence Valota Adans. is based on *Andropogon insularis* L.

b. More than one species mentioned with the original description. In these cases a selection must be made. The principle underlying the selection is to choose the species that seems most nearly to represent the author's concept of the genus. We may usually assume that a figured species represents this concept, as an author naturally picks out for illustration a typical species. Therefore, in general, a figured species is selected as the type. If more than one species is figured, the type is assumed to be one of the figured species. Sometimes certain species can be excluded from consideration as the type because they are referred somewhat doubtfully to a new genus by the author or because they do not agree perfectly with the generic description. From those available one may often assume, as most typical, a well-known economic species, or the historically oldest, or one native in the author's country or familiar to him in cultivation. If there are two or more species equally available as the type and one must be chosen arbitrarily, then we may well choose the one which results in the application of the generic name in the commonly accepted sense. Usually the choice of the first of the equally available species accomplishes this result. In order to illustrate the manner in which type selection works out in practice, several illustrative examples are given below.

COIX L. Sp. Pl. 972. 1753. Linnaeus describes 2 species, *C. lachryma-jobi* and *C. dactyloides*. In typifying the genera of the Species Plantarum, it is necessary to consider at the same time the fifth

edition of Linnaeus's Genera Plantarum which appeared the following year. There are no descriptions of genera in the former work, these being set forth in the latter. Linnaeus often cites, in that place, a figure in some earlier work which may determine the type. Under Coix is cited Tournefort's plate 302, which represents the first of the two species above mentioned. We are thus justified in selecting this species as the type of Coix.

ERIANTHUS Michx. Fl. Bor. Amer. 1: 54. 1803. Michaux describes 2 species, *E. saccharoides* and *E. brevibarbis*. He derives the generic name from two Greek words meaning hairy flower because the flowers are involucrate with very dense wool. The first species is selected as the type because the spikelets are very woolly, while in the second species the hairs are short.

ANDROPOGON L. Sp. Pl. 1045. 1753. Linnaeus describes 12 species. The reference in the Genera Plantarum is "Roy. lugdb. 52," that is, the Flora Leydensis, published in 1740, in which Royen, the author, describes 2 species of Andropogon. I think the type should be selected from these two. There is no reason to think that one of these was more familiar than the other to Linnaeus or to Royen. *Andropogon virginicus* is selected as the type because this has priority of position in the Species Plantarum, and because this selection retains the generic name for the group universally known as Andropogon. The other species, *A. hirtus*, belongs to the genus or subgenus Cymbopogon. If *A. hirtus* were made the type of Andropogon, that name would have to be applied to the group now known as Cymbopogon and the genus long known as Andropogon would have to receive a different name. Logical typification may lead to confusing shifting of names, but confusion should not be brought about by the arbitrary selection of the type species.

HOLCUS L. Sp. Pl. 1047. 1753. Seven species are described by Linnaeus, *H. sorghum*, the nonsaccharine sorghum, *H. saccharatus*, the sweet sorghum, *H. halepensis*, the Johnson grass, *H. lanatus*, the velvet grass, and three other little-related species. The nomenclatorial history of these species shows a conflict between concept and fact, between what should have been done and what was done. The first 3 species were segregated from the others in 1763 by Adanson who applied to them the old pre-Linnaean name Sorghum. The last three of the original 7 species were assigned to other genera, leaving under Holcus the remaining species, *H. lanatus*. This procedure was equiva-

lent to the selection of *H. lanatus* as the type of Holcus. What should have been done, and what is herewith done, was to select *H. sorghum* as the type species, for the following reasons: In the Genera Plantarum Linnaeus cites, under Holcus, the name "Sorgum Mich.," indicating that he was applying the name Holcus to what was called Sorgum by Micheli and others of his time, that is, to what we call Sorghum. Furthermore and most important, the description of the genus Holcus in the Genera Plantarum applies only to the sorghums and not to the other 4 species in the Species Plantarum. Therefore I have selected *Holcus sorghum* as the type of Holcus. Holcus then becomes the equivalent of Sorghum and replaces that as a generic name. This is one of the few cases where a logical selection of the type species changes the application of a well-known name among economic plants.

LEERSIA Swartz, Prod. Veg. Ind. Occ. 21. 1788. Swartz describes 3 species. All are equally available as type species. The third is chosen because it is the oldest historically, being based on *Phalaris oryzoides* L., the other two being described by Swartz as new.

PHALARIS L. Sp. Pl. 44. 1753. Five species are described by Linnaeus. The first, *P. canariensis*, is chosen as the type because this is the only one of the five that was known to the older authors as Phalaris.

AIRA L. Sp. Pl. 63. 1753. Linnaeus describes 14 species. The name was first used by Linnaeus in his Flora Lapponica, 1737, where he describes four species, these evidently representing his concept of Aira. From these four the second (*A. caespitosa*, usually known as *Deschampsia caespitosa*) is arbitrarily chosen as the type. To select the first, *A. spicata* (*Trisetum spicatum*), as the type would result in changing the application of the name Aira to the genus now called Trisetum. It causes less confusion to apply the name Aira to the group known as Deschampsia, as is done by many European botanists, than to replace the name Trisetum.

DACTYLIS L. Sp. Pl. 71. 1753. Two species are described: *D. cynosuroides*, now referred to Spartina, and *D. glomerata*, the orchard grass. The second is selected as the type because it was described earlier by the author in his Flora Suecica.

POA L. Sp. Pl. 67. 1753. Linnaeus describes 17 species. From the species described in his Flora Lapponica, *P. pratensis* is selected as the type as this is a familiar, widely distributed, and economic species.

The above examples illustrate the method employed in the selection of types. It has been intended to consider all the factors in each case and to determine if possible what species represented best the author's concept, or, in case two or more species are equally available for consideration, to select the type in such a way as to cause the least confusion in our nomenclature. Aside from Linnaean genera there are comparatively few cases where the evidence does not lead to a definite species as the type. In these few cases an arbitrary selection must be made in such a way as to cause the least confusion in the application of names.

The type of a genus having been fixed it behooves subsequent authors, who would divide genera, to retain the original name for that part which includes the type species.

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